

Decoupled fog and rainfall occurrence at a subtropical rainforest in northern Taiwan

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Fushan Experimental Forest (FEF) of northeastern Taiwan is a subtropical rainforest characterized with frequent rainfall and cloud/fog. The cloud/fog occurrence has been suggested to be a key factor contributing to the very abundant and diverse epiphytes growing at the FEF. However, currently there is no quantitative information of fog frequency and intensity at the FEF. In this study, we collected and monitored fog intensity and frequency using visibility sensor for 2018 at the FEF. The results indicate that fog, defined as when the visibility is less than 1000 m, occurred 234 days. The frequency of very thick fog (visibility < 200 m) comprised 10% (in July) to more than 50% (in March–March) of total foggy period. On a daily basis, fog is least common around noon then and most common near midnight. This pattern was rather consistent throughout the year. There were no significant correlations between 1) monthly rainy days, 2) monthly rainfall and 1) monthly foggy days and 2) monthly foggy hours. Thus, the occurrence of fog and rain seem to be somehow independent. This also suggests that 1) during rainless days, fog could be an important water source for epiphytes and 2) projections on rainfall patterns as a result of climate change may not be a good predictor of fog frequency and intensity patterns. A thorough understanding of the use of fog relative to rain by epiphytes are required to accurately predict how climate change may affect epiphyte survival and growth via changes in rain and fog frequency and intensity.